

REMARKS

Applicant affirms the election of Group II including original claims 2-40, 42-43, and 45-50.

With this amendment, claims 2, 4-19, 22-30, and 61-62 remain in the present application. Claims 1, 3, 20-21 and 31-60 are hereby canceled without prejudice. Claims 2, 4-19, and 22-30 are hereby amended. Claims 61 and 62 are newly added. No new matter is being added.

Claim Rejections -- 35 USC 112

Claims 2, 4-19, and 22-30 stand rejected under 35 USC 112, second paragraph, as being indefinite. Applicants have hereby amended claims 2, 4-19, and 22-30 so as to correct the indefiniteness in the original claims. For example, lack of antecedent basis in various claims and other indefinite aspects have been corrected. Applicants respectfully submit that the amended claims now overcome the various rejections for indefiniteness.

Claim Rejections -- 35 USC 102

Claims 2, 4-19, and 22-30 stand rejected under 35 USC 102 as being anticipated by Lee et al. (USP 5,748,789). This rejection is respectfully traversed in relation to the claims as now amended.

Lee et al

Applicants respectfully submit that the claimed invention is neither disclosed nor taught by Lee et al.

Lee et al does not relate to filling an **exposed area** as per the claimed invention. Instead, Lee et al apparently relates to “**transparent**” **blocks** within a mask of an object. Consider, for example, FIG. 35 of Lee et al.

Fig. 35

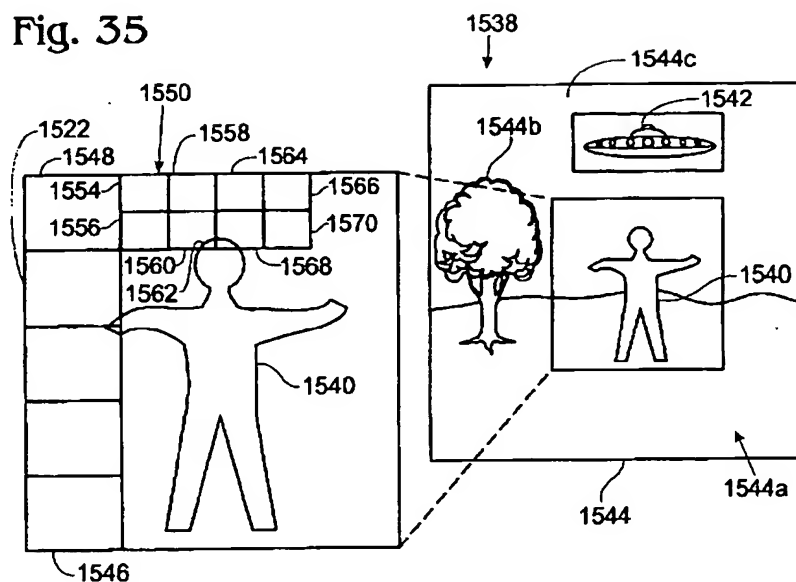


FIG. 35 depicts **example transparent blocks 1554, 1556, and 1558** in a mask for the object 1540. As discussed in Lee et al., **encoding/decoding can be skipped** for these transparent blocks.

Discussion of the Claimed Invention

Claim 2 has been amended and now recites as follows.

2. A method of **filling an exposed area** of unfilled pixels in an image frame of a video sequence using color information from boundary segments adjacent to the exposed area, the method comprising:

determining the boundary segments adjacent to the exposed area;

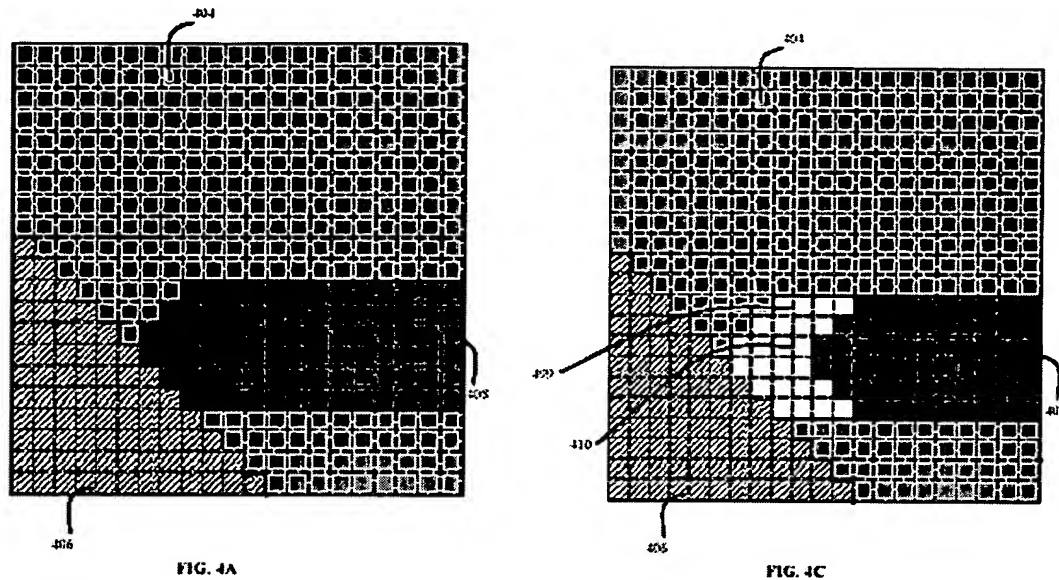
determining a kernel around each unfilled pixel along a boundary of the exposed area; and

calculating a statistical distribution of colors for each boundary segment adjacent to the exposed area based on color values of all pixels within the kernel belonging to that boundary segment.

(Emphasis added.)

As seen from the above, claim 2 now recites, “A method of **filling an exposed area** of unfilled pixels in an image frame of a video sequence using color information

from boundary segments adjacent to the exposed area.” (Emphasis added.) Such an exposed area is described, for example, in relation to FIGS. 4A and 4C of the present application. For convenience of reference, these figures are reproduced below.



As seen above, the exposed area 410 of unfilled pixels is shown in FIG. 4C due to the motion of an image segment 408 relative to its position in a previous frame (see FIG. 4A). In contrast, Lee et al pertains to “transparent” blocks, not to filling exposed areas.

A first step of the method of claim 2 recites “**determining the boundary segments adjacent to the exposed area**” (Emphasis added.) In the example shown above in the FIG. 4 sequence, the boundary segments adjacent to the exposed area 410 include image segments 404, 406, and 408. Lee et al does not disclose or teach determining boundary segments adjacent to an exposed area.

A second step of the method of claim 2 recites “**determining a kernel around each unfilled pixel** along a boundary of the exposed area.” (Emphasis added.) FIG. 4D, reproduced below for convenience, shows an example kernel region 412 (the shaded square) around an example unfilled pixel 499.

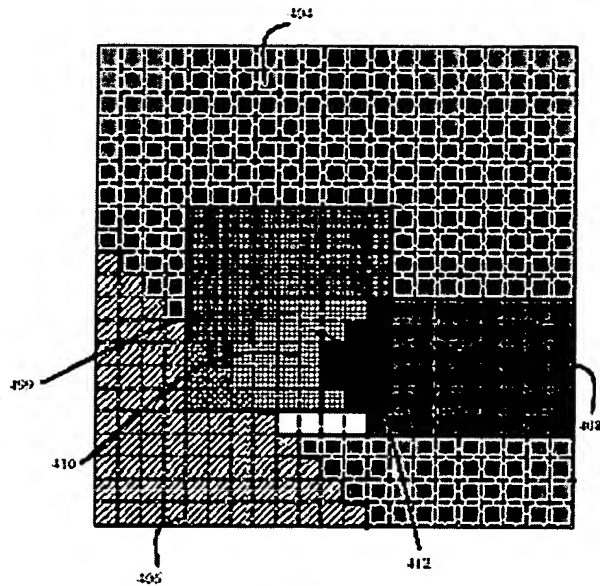
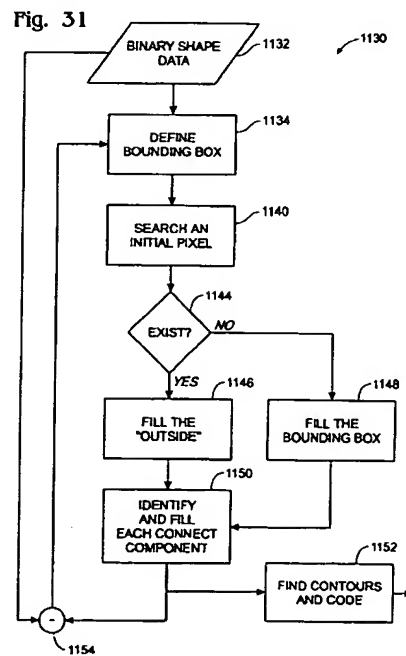
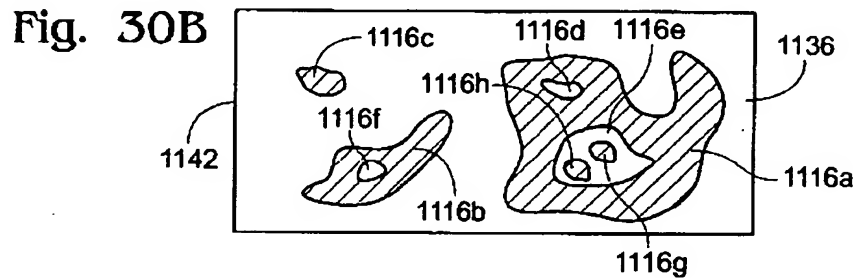


FIG. 4D

This claim element of “determining a kernel around each unfilled pixel along a boundary of the exposed area” is not disclosed or taught by Lee et al. In particular, FIG. 31, elements 1132 and 1134, of Lee et al. does not disclose or teach this limitation. For convenience of reference, FIG. 31 of Lee et al is reproduced below.



Block 1132 in FIG. 31 of Lee et al recites “binary shape data,” and block 1134 recites defining a “bounding box”. An example bounding box 1136 around binary shape data is shown in FIG. 30B, which is reproduced below.



As seen from above FIG. 30B, **the bounding box 1136 surrounds the entire set of binary shapes.**

The bounding box of Lee et al is substantially different from the claimed “kernel” of amended claim 2. In particular, **the claimed “kernel” includes only includes a region of pixels surrounding a particular pixel along a boundary of an exposed area.** The claimed kernel is not a mask enclosing an entire set of shapes like the bounding box 1136 in Lee et al.

A third step of the method of claim 2 recites **“calculating a statistical distribution of colors for each boundary segment adjacent to the exposed area based on color values of all pixels within the kernel belonging to that boundary segment.”** (Emphasis added.) This is supported, for example, in FIG. 3 and related description. For convenience of reference, FIG. 3 is reproduced below.

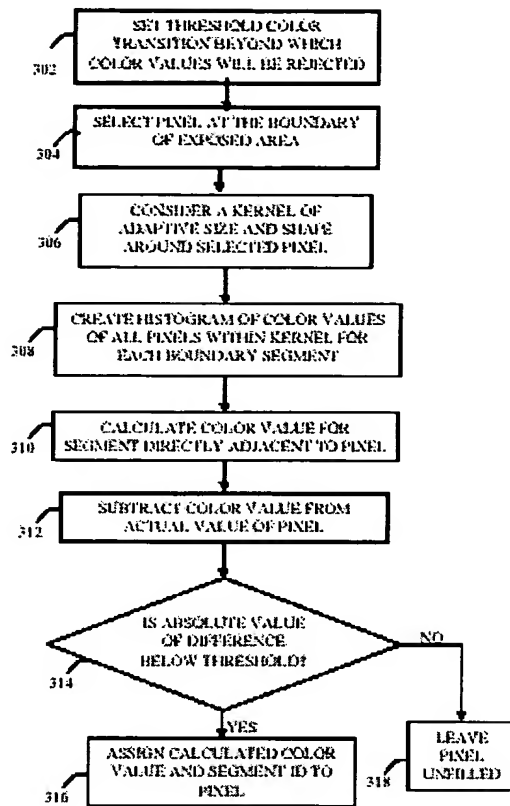


FIG. 3

As shown above, step 308 in FIG. 3 pertains to creating a histogram (i.e. a statistical distribution) of color values of all pixels within kernel for each boundary segment. Lee et al. does not disclose or teach this limitation.

For at least the above-discussed reasons, applicants respectfully submit that claim 2 is now patentably distinguished over the cited art.

Claims 4-15 depend from claim 2. Hence, applicants respectfully submit that claims 4-15 are now patentably distinguished over the cited art for at least the same reasons discussed above in relation to claim 2.

Similar to claim 2, amended claim 16 pertains to “**filling an exposed area** of unfilled pixels in an image frame of a video sequence.” (Emphasis added.) Claim 16 further recites the use of “color information from boundary segments adjacent to the exposed area.” In addition, claim 16 recites “calculating a percentage of pixels within the exposed area that is filled by each of the boundary segments” and “calculating a

geometric parameter that represents a geometric shape of a portion filled by each of the boundary segments.” Hence, for similar reasons as discussed above in relation to claim 2, claim 16 is now patentably distinguished over the cited art.

Claims 17-19 and 22-30 depend from claim 16. Hence, applicants respectfully submit that claims 17-19 and 22-30 are now patentably distinguished over the cited art for at least the same reasons discussed above in relation to claim 16.

New claim 61 is an apparatus claim corresponding to method claim 2. Applicants respectfully submit that claim 61 is patentably distinguished over the cited art for at least the same reasons discussed above in relation to claim 2.

New claim 62 is an apparatus claim corresponding to method claim 16. Applicants respectfully submit that claim 62 is patentably distinguished over the cited art for at least the same reasons discussed above in relation to claim 16.

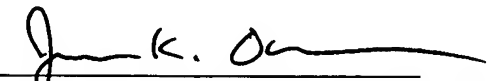
Conclusion

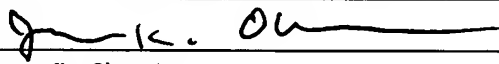
Applicants respectfully submit that claims 2, 4-19, 22-30, and 61-62 are now patentably distinguished over the cited art. Favorable action is respectfully requested.

Respectfully submitted,
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